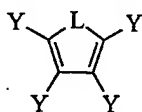


## WHAT IS CLAIMED IS:

1. A compound (monomer) comprising i) one or more arylethynyl groups (A-functional groups), ii) one or more ring structures comprising two conjugated carbon-to-carbon double bonds and a leaving group L (B-functional groups), and iii) one or more ethynyl groups (C'-functional groups), characterized in that said A- and C'-functional groups are capable of reaction under cycloaddition reaction conditions with said B-functional groups to thereby form a cross-linked, polyphenylene polymer.

2. A compound according to claim 1 corresponding to the formula,



wherein L is -O-, -S-, -N=N-, -C(O)-, -(SO<sub>2</sub>)-, or -OC(O)-;

Y is independently in each occurrence hydrogen, halogen, an unsubstituted or inertly substituted hydrocarbyl group, Y', or two adjacent Y groups together with the carbons to which they are attached form a fused aromatic ring,

Y' is a single covalent bond or a divalent derivative of an unsubstituted or inertly substituted hydrocarbyl group joining two or more divalent remnants of the foregoing structure,

and in at least one occurrence, Y is -Y''(-C≡CR<sup>1</sup>)<sub>m</sub> and in at least one other occurrence, Y is -Y''-(C≡CR<sup>2</sup>)<sub>n</sub>; or

in at least one occurrence, Y is -Y''(-C≡CR<sup>1</sup>)<sub>m</sub>(C≡CR<sup>2</sup>)<sub>n</sub>; wherein,

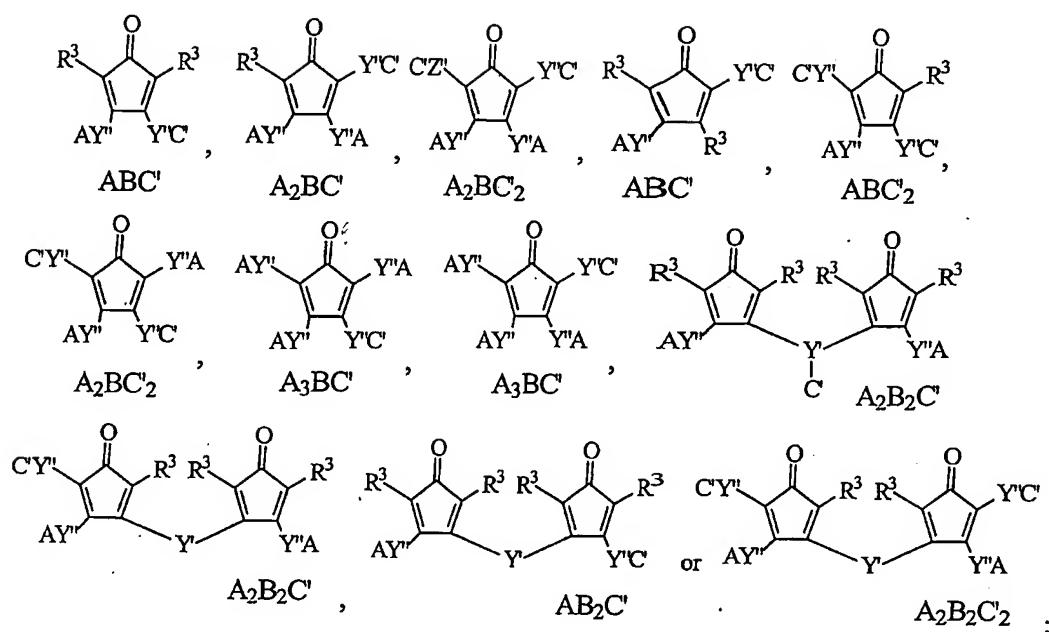
Y'' is a single covalent bond or a polyvalent derivative of an unsubstituted or inertly substituted hydrocarbyl group;

R<sup>1</sup> is C<sub>6-20</sub> aryl;

R<sup>2</sup> is hydrogen, C<sub>1-6</sub> alkyl, C<sub>1-6</sub> hydroxyalkyl, or trimethylsilyl; and

m and n are integers from 1 to 5.

3. A compound corresponding to the formula:

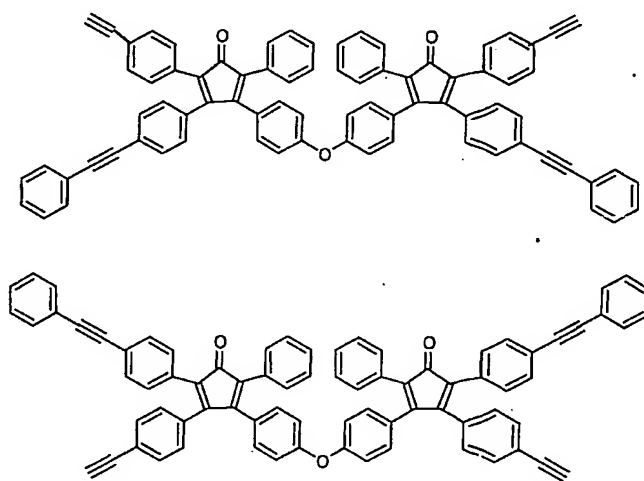


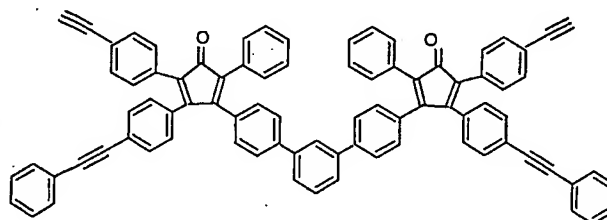
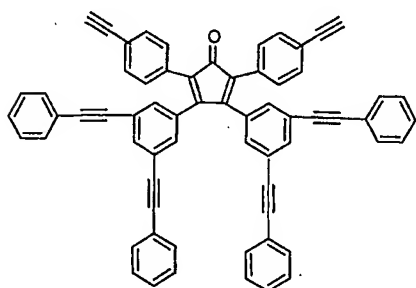
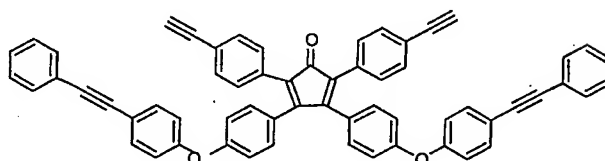
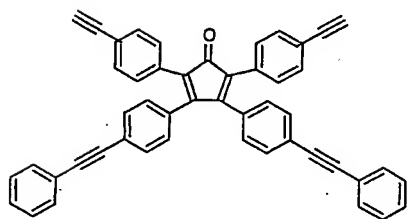
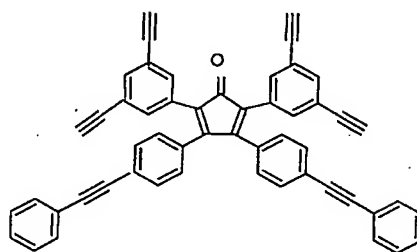
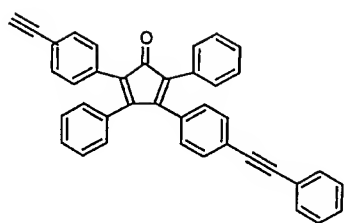
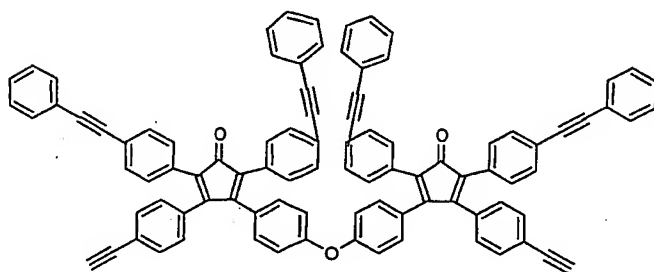
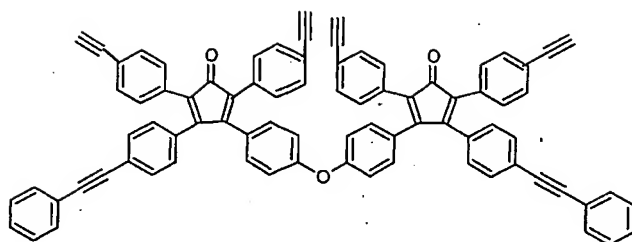
wherein  $R^3$  is  $C_{6-20}$  aryl or inertly substituted aryl;

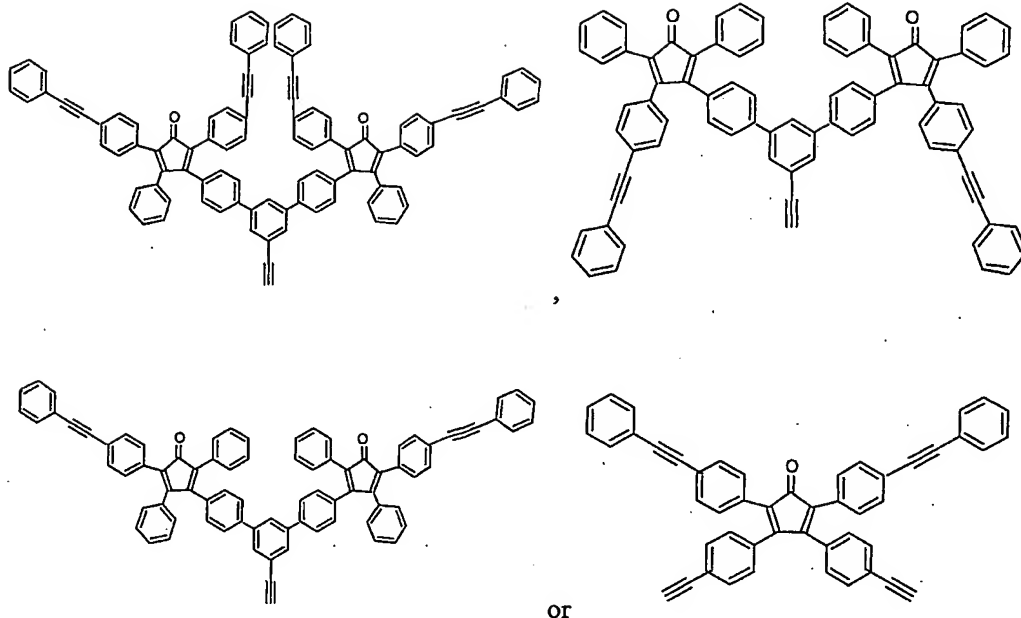
$C'$  is as defined in claim 1, and

$A$ ,  $Y'$  and  $Y''$  are as defined in claim 2.

- 5 3. A compound according to claim 1 wherein  $A$  at each occurrence is phenylethynyl and  $C'$  at each occurrence is ethynyl.
4. A compound according to claim 4 corresponding to the formula:







5. A cross-linked polymer formed by curing a composition comprising a compound according to any one of claims 1-4.
- 5 6. A cross-linked polymer according to claim 5 wherein the composition additionally comprises a poragen.
7. A porous matrix formed by removing the poragen from the cross-linked polymer of claim 6.